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William Huggins, Esq., F.R.S., President, in the Chair.

Frederick Newton, Esq., Hill Side Lawn, Hornsey Lane, was balloted for and duly elected a Fellow of the Society.

On a Peculiarity of Personal Equation.

By Capt. W. M. Campbell, R.E.

The following remarks on what is to me a novel feature of "Personal Equation" may prove of some interest.

Since the end of 1875 I have been employed, in association with Capt. Heaviside, R.E., on the determination of differential longitudes in India, by means of the Electric Telegraph.

In such operations, Personal Equation being a matter of first importance, we devoted nine nights, at intervals throughout the course of observations in 1875–6, to the determination of our relative equation.

The method followed was always that of "divided transits," in which one observer takes the first portion of a star's transit, and the second finishes the observation at the same telescope.

I should note that the transit instruments used are powerful telescopes, by Cooke & Sons, of about 5 ft. focal length, with 5-in. objectives.

The wires are 25 in number, in tallies of 5 each, the intervals being about 2½ sec. between wires, and 5 sec. between tallies.

We always observed with an oblique eye-piece, so that the line of sight was at right angles to the axis of the telescope, and stars were observed with their actual motion.

A chronograph being used, it is easy for observers to change places in the middle of a transit, observing it over the first and last 10 wires respectively, supposing, at least, that no change is

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required in the adjustment for focus of eye-piece. In taking a set of such transits (we generally took 20 on each night), the order of observation was alternated; thus the observer who took the last part of one transit observed the first portion of the next.

The value of our relative equation, adopted from all such observations, was $C-H=+0^{s}\cdot064\pm0^{s}\cdot0057$, Capt. Heaviside observing in advance of me.

When near the completion of the reduction of our observations of 1875–6 generally, we discovered that we had two distinct equations when observing imitation transits, according as the motion of the object was from right to left or left to right.

This led to a re-discussion of all the observations of "divided transits," arranged in two sets—viz. North Zenith Stars, or those moving from right to left, and South Zenith Stars, or those moving from left to right—with the following results:—

By NZ Stars, $C-H = +\overset{s}{0}\cdot124 \pm \overset{s}{0}\cdot0087$
„ SZ „ $C-H = +0\cdot040 \pm 0\cdot0034$

The application of these equations, instead of the one first adopted, very much improved our general results.

On resuming observations this season—1876–7, we agreed to observe every close Zenith star on both sides, i.e. to observe it as a North Zenith star over the first 10 wires, and then, reversing the eye-piece, to take it as a South star over the last 10 wires, or *vice versâ*, stars being observed in each order nearly equally.

From 21 stars observed by me in this way during January, I find my equation to be

$$N-S = +\overset{s}{0}\cdot077 \pm \overset{s}{0}\cdot0067$$

my observation of North stars, moving from right to left, being slower than that of South, or left to right moving, stars by $0^{s}\cdot077$. I have not yet heard the result of similar observations by Capt. Heaviside.

Bombay,
1877, *March* 19.

Observations of the Phenomena of Jupiter's Satellites at the Observatory, Adelaide, and Notes on the Physical Appearance of the Planet. By Charles Todd, Esq., C.M.G.

The Astronomer Royal has received from Charles Todd, Esq., of the Observatory, Adelaide, the following communication and observations of *Jupiter's* Satellites:—

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